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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/755,951 01/04/01 VESTAL

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EXAMINER

IM52/0717

PATENT ADMINISTRATOR
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BOSTON MA 02110

~~SODERQUIST, A~~

ART UNIT

PAPER NUMBER

9

1743

DATE MAILED:

07/17/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/755,951

Applicant(s)
Vestal

Examiner
Arlen Soderquist

Art Unit
1743



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 75-94 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 75-94 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 8 20) ☐ Other: _____

1. Applicant is reminded of the continuing obligation under 37 CFR 1.56 to timely apprise the Office of any litigation information, or other prior or concurrent proceeding, involving Patent No. 5,498,545, which is material to patentability of the claims under consideration in this reissue application. This obligation rests with each individual associated with the filing and prosecution of this application for reissue. See MPEP §§ 1404, 1442.01 and 1442.04.

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 75-91 and 93 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In claims 75 and 90 the final wherein clause in combination with the claimed structure is not supported by the originally filed specification. In the figures there are two different embodiments shown for the vacuum lock. The first shown in figures 4-5 and 8 includes a storage chamber (60) having a sample storage cassette (80) for storage of a plurality of sample plates (10). The second shown in figures 6-7 is a simplified lock without the storage chamber or capability of storing a plurality of sample plates. In the paper filed April 5, 2001, applicant points to figures 6-7 and 9 for support of claim 75 along with sections of columns 6 and 8 directed to the structure used to handle a plurality of sample plates. A portion of column 8, lines 14-24 is presented below.

“When the residual pressure in this chamber 60 has reached a predetermined acceptable vacuum level (e.g., 20 millitorr), the valve 82 is opened, and the input and output doors 58 and 76 are opened, allowing sample plates to be transported between the sample storage chamber 60 and the ion source chamber 74 of the mass spectrometer without significantly degrading the vacuum of the mass spectrometer. A conventional vacuum pump 96 is provided for maintaining the chamber 74 at a desired pressure. Once transport of a plate 10 is complete, the doors 58 and 76 may be closed by computer control. “

This appears to support the language of the wherein clause, however the following portion of column 7, lines 11-24 (emphasis added) points to a different sequence for providing fluid communication under vacuum.

“The system as shown in FIGS. 4 and 5 allows sample plates 10 to be loaded into the storage region of the vacuum lock chamber 68, while another sample plate 10 is being analyzed in the ion source chamber 74 of a mass spectrometer. **In fully automatic operation**, whenever a new sample plate 10 may be loaded, the storage chamber 60 is evacuated, **the input door 58 between the storage chamber 60 and the vacuum lock chamber 68 is opened, and the new sample plate is automatically moved by transporter 89 to a sample transport tray 87 provided in the vacuum lock chamber 68. The input door 58 is then closed and the vacuum lock chamber 68 remains evacuated.** The plate 10 positioned by sample transport tray 87 is moved within chamber 68 by an air cylinder transport mechanism 78.”

The above section clearly teaches closing the input door after it is removed from the storage chamber. Closing input door 58 is important because it allows an operator to remove or add sample plates to the storage cassette in the storage chamber while a sample plate is being analyzed. From this it can be seen that the doors which are required to be open for fluid communication between the vacuum lock chamber and the ion source chamber are not open during the full time that a sample plate is being disassociated, transported and associated in the embodiment that is capable of storing a plurality of sample plates. In the embodiment of figures 6-7 the vacuum lock does not have the capability of storing a plurality of sample plates because it is intended to be used for manual insertion of individual sample plates (column 8, lines 29-33). Thus the embodiment of figures 6-7 cannot provide support for continuous fluid communication between the vacuum lock chamber and the ion source chamber during the full time that first and second sample plates are being disassociated, transported and associated. Additionally examiner was not able to find support for placing a storage cassette in the vacuum lock embodiment of figures 6-7.

4. Claims 75-94 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: some sort of control element and since the fluid communication and vacuum are specified to be maintained during specific time periods, structure

to break or interrupt the fluid communication during other periods. In other words there is structure to isolate the lock chamber from the ion source chamber during certain times which must be claimed in order to be able to control the fluid communication at other times.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 75-81 and 84-94 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beavis (US 5,288,644) in view of Wilhelmi (*Safeguards Tech., Proc. Symp.*), Weinberger and Duffin. In the figures and associated discussion Beavis teaches a mass spectrometry instrument (30) and sample preparation device for determining the sequences of DNA molecules. Column 3, lines 19-23 teach that an objective of the device is to automate the analysis process. The sample preparation device includes an autosampler (10), matrix container (12) and sample containers (14) under the control of a computer (22). This instrument is used to prepare and analyze a plurality of samples by matrix-assisted desorption/ionization. In preparing a sample the autosampler mixes a sample with the matrix material and spots it (18) at a specific, known location on a disk (20) or other media having a planar surface relative to a reference mark (24) on the disk (column 4, line 53 to column 5 line 24). The known location of each spot is loaded into the computer (22). After spotting, the samples (18) are dried and inserted into the mass spectrometer through a vacuum lock (column 4, lines 63-67) which would have some form of door to allow the insertion of the

sample into the lock and subsequently into the ion source of the spectrometer. Also inherent in a vacuum lock would be the removal of ambient atmosphere in the lock during the pumpdown phase to prevent exposure of the sampling region to the ambient atmosphere. Column 5 lines 20 - 28 teach the positional adjustment of the disk (20) within the spectrometer to allow the disk to be rotated so that each of the 120 samples on the disk can be measured. Column 5 lines 30 - 34 teach that the particular disk geometry is only exemplary and other geometries employing linear translation of the planar surface are also contemplated. Column 5 lines 35 - 45 teach maintaining the disk at a potential during ion formation with a laser (32). Column 6, lines 26 - 33 teach the attenuation of the laser output. Column 4, lines 9 - 30 of the instant specification teaches various ways of providing the samples at fixed locations including just knowing the coordinates of the location which Beavis clearly teaches. Beavis fails to teach maintaining a second sample containing disk under vacuum conditions while the first is being struck with laser pulses, a curing chamber, identification means in the support, one or more samples in the vacuum lock during processing of one sample in the spectrometer, or magnetic means on the sample tray and transports for coupling during sample tray movement.

In the paper Wilhelmi discusses an automatic analytical laboratory for mass-spectrometric isotopic-dilution analysis of uranium and plutonium in fuel solutions. The individual basic processes, i.e., sampling, spiking, and chemical processing of the samples, mass-spectrometric measurement and calculation of the analytical data, are automated independently. Experience obtained over 4 years of manual processing and measurement of several hundreds of samples caused the conversion to automation. The different process steps required for sampling, spiking, and chemical processing of the samples are implemented by components which are combined by a unit-construction system. For the mass-spectrometric measurements commercial equipment was automated. The sample throughput of this equipment is to be increased to 48 measurements per day by a high-vacuum lock system for preheating the samples. Further commercial equipment is used to calculate the results of the analyses whose program is being developed. The concept and designing of the facility and the present state of development are reported. Relevant to the instant claims are figure 3 and its associated discussion. In the figure three separate lock chambers are

shown. In the left chamber sample degassing occurs. The left chamber is connected to the middle chamber such that during the degassing the two chambers are isolated from each other. After degassing the two chambers are brought into fluid communication and the sample cassette with its plurality of samples is automatically transferred into the middle chamber. This chamber is directly connected to the ion source and figure 3 appears to show that there is fluid communication during the insertion of a sample into the ion source. After the analysis is finished the sample is returned to the cassette and the next sample is analyzed. When the samples in a cassette have been analyzed the cassette is transferred to the right chamber in a manner similar to the first transfer. The first section of page 171 discusses the advantages of the automation including saving time and improving reproducibility.

In the figures and associated discussion Weinberger teaches a laser desorption mass spectrometer and sample preparation device. Of particular interest to the instant application are figures 6, 6a and 14 teaching a drying chamber (320) to assist in drying the samples and means for storing and inserting multiple sample containing probes in a vacuum chamber connected to a vacuum chamber for the mass spectrometer ion source. In the vacuum chamber (28) a sample cassette (152) containing a plurality of sample probes (30,154) which has a magnetic or mechanical coupler (162) that interacts with a similar coupler (160) on the transporter device (159).

In the paper Duffin teaches an automated sample transport system for chromatography/secondary ion mass spectrometry. The design of a new sample cell for a large-scale secondary ion mass spectrometer is described. Unique to this new source chamber is the incorporation of large piezoelectric translator stages capable of 20 cm \times 20 cm movement with high resolution. In addition, the source chamber is designed so that interchangeable detector assemblies can be fitted to the chamber. The paragraph bridging pages 1072-1073 discusses previous sample manipulation stages using mechanical linkages from external drives or vacuum compatible stepper motors and how the piezoelectric translators do not have the disadvantages of heat control or loss of resolution due to gears. This translation stage allows controlled movement of the sample supports with a position reproducibility of 1 μ .

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a vacuum lock connection as taught by Wilhelmi into the Beavis device and method because as shown by Wilhelmi it would have allowed the sample preparation and analysis to occur under conditions that would have provided further advantages related to automation. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the sample cassette as taught by either Wilhelmi or Weinberger and transporter mechanism of Weinberger into the Beavis device because one of ordinary skill in the art would have recognized that having multiple sample trays in the sample chamber would allow the instrument to operate for extended periods of time without operator interaction and would facilitate movement of the sample trays into and out of the mass spectrometer as shown by both Weinberger and Wilhelmi. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a drying chamber as taught by Weinberger into the Beavis device because one of skill in the art would have recognized that the drying chamber would increase the preparation speed by reducing the time for the samples to dry. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the movement mechanism of Duffin into the Beavis device because of its ability to translate a sample support to position the support for vaporizing sample from multiple locations and its advantage over external drives and vacuum compatible drives as taught by Duffin.

7. Claims 82 is rejected under 35 U.S.C. § 103 as being unpatentable over Beavis in view of Wilhelmi, Weinberger and Duffin as applied to claim 81 above, and further in view of Ledford. Beavis does not teach indicia at each sample location.

In the patent Ledford teaches apparatus and method for injecting samples into a mass spectrometer. Column 2, line 56 to column 3, line 31 teach that the samples are deposited on a tape or rotatable disk which may be inserted into the ionization chamber through a vacuum lock mechanism. Also taught is mixing the sample with an easily vaporizable matrix material to enhance volatilization of nonvolatile or thermolabile samples (also see column 11, lines 5-21). Optical indicia are provided to give sample identification and sample position information (column 10, lines 50-68).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include indicia as taught by Ledford at the sample positions of Beavis because of the ability to provide indexing and sample information as taught by Ledford.

8. Claim 83 is rejected under 35 U.S.C. § 103 as being unpatentable over Beavis in view of Wilhelmi, Weinberger and Duffin as applied to claim 75 above, and further in view of Bakker. Beavis does not teach a door member between the ion source chamber and the vacuum lock.

In the paper Bakker presents a direct-insertion sample-handling system for mass spectrometers. The direct-insertion lock was brazed to the side of the vacuum chamber of the mass spectrometer opposite the source. The stainless steel probe does not need an exceptionally high surface finish; machining to a fine finish followed by polishing with a linen mop is sufficient. The insertion lock is isolated from the source by a 1 inch quarter-swing butterfly valve (door). The whole assembly is made of stainless steel. Sealing is done with viton O-rings. The seals are so effective that differential pumping is no longer used. Sample introduction takes <1 minute, and at all times there is a positive control over the probe position. None of the source supplies had to be switched off during sample introduction.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the door (swinging valve) of Bakker between the vacuum lock and the ion source chamber as taught by Bakker in the device of Beavis because of the ability to rapidly introduce samples into the ion source chamber under vacuum without switching off the ion source as taught by Bakker.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The additional art is related to sample insertion into a mass spectrometer or laser desorption in a mass spectrometer. It is noted that the Wilhelmi report has been submitted for translation since it appears to give a more complete description of the system.

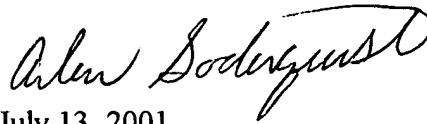
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arlen Soderquist whose telephone number is (703) 308-3989. The examiner can normally be reached from about 5:30 AM to about 3:00 PM on Mondays and from about 7:30 AM to about 5:00 PM on Tuesday through Thursday and alternate Fridays.

Application/Control Number: 09/755,951
Art Unit: 1743

9

For communication by fax to the organization where this application or proceeding is assigned, (703) 305-7719 may be used for official, unofficial or draft papers. When using this number a call to alert the examiner would be appreciated. Another number for official papers is (703) 305-3599. The above fax numbers will generally allow the papers to be forwarded to the examiner in a timely manner.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



July 13, 2001

ARLEN SODERQUIST
PRIMARY EXAMINER